POST-TRAUMATIC STRESS DISORDER (PTSD) FOLLOWING BURN INJURIES: A COMPREHENSIVE CLINICAL REVIEW

STRESS POST- TRAUMATIQUE (SPT) APRÈS BRÛLURE: UNE REVUE

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SUMMARY. Burns are a global public health problem with a large number of psychosocial and psychological problems that may ensue after burn injuries. One of the commonest psychological problems seen after burn injuries is depression, anxiety and post-traumatic stress disorder (PTSD). The following paper reviews the existing literature on PTSD following burn injuries. The concept of PTSD is explained for the non-psychiatrist involved in burn rehabilitation. The various psychosocial factors that determine the causation and course of PTSD following burn injuries are discussed. PTSD following burn injuries in special populations like women, children and adolescents, intentional burns and self immolation are also discussed. The role of cultural factors in the development of PTSD are elucidated and future research needs are laid out. PTSD is a very common occurrence after burn injuries and needs a multidisciplinary team evaluation for its management.

Keywords: burns, stress, post-traumatic stress disorder, PTSD

RÉSUMÉ. *Les brûlures représentent un problème de santé publique mondial, avec un nombre élevé de séquelles psychologiques et psycho- sociales, les plus fréquentes étant l'anxiété et le SPT. Nous avons réalisé une revue de la littérature concernant le SPT, afin de l'expliquer aux brûlologues non psychiatres. Nous avons évalué les facteurs psycho- sociaux pouvant interférer avec la survenue et l'évolution du SPT ainsi que les rôles du terrain (femmes, enfants, adolescents) comme de la cause (agression, tentative de suicide). Les facteurs culturels ont aussi été étudiés. Des axes d'études futures sont proposés. Le SPT est fréquent après brûlure et doit faire l'objet d'une prise en charge multidisciplinaire.*

Mots-clés : *brûlure, stress post traumatique*

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Introduction

Burns are a global public health problem, with the maximum incidences for burns occurring in low-and-middle-income countries (LMICs) of Africa and South East Asia. They are among the leading causes of disability-adjusted life-years (DALYs) lost in low- and middle-income countries.[1] India records 6-7 million cases of burns every year, of which one million cases involve moderate-severe burns. The incidence of child deaths from burns is currently over 7 times higher in low- and middle-income countries than in high-income countries.[2]

The survival rates for patients with burn injuries have increased over the years with advancements in treatment modalities. However, what continues to stay shadowed are the emotional pain and overall emotional needs over physical treatment needs for burns patients.[3] The nature of burn injuries is such that more than 90% of patients do experience some form of symptoms of stress. Some people may develop acute stress disorder (ASD), and as many as one third of burn patients also develop post-traumatic stress disorder (PTSD).[4] Sometimes clinical presentations of burns patients also show subsyndromal PTSD (which does not meet the criteria for ASD or PTSD). However, symptoms of chronic stress are observed from right after the incident to over a year after treatment / hospitalisation, and sometimes for over 3-4 years.[5] In this article, when we use the terms victims, patients or survivors, we refer to people (men/women) who have suffered from some form of (moderate/severe) burn injury.

PTSD and relevant terminology

Post-traumatic stress disorder (PTSD) is a psychiatric condition in people who have experienced or witnessed a traumatic event such as a natural disaster, a serious accident, a terrorist act, war/combat, rape or other violent personal assault. People with PTSD have intense, disturbing thoughts and feelings related to their experience that last long after the traumatic event has ended. They may relive the event through flashbacks or nightmares; they may feel sadness, fear or anger; and they may feel detached or estranged from other people. People with PTSD may avoid situations or people that remind them of the traumatic event, and they may have strong negative reactions to something as ordinary as a loud noise or an accidental touch.[6]

PTSD develops when one continues to have the symptoms for more than a month and they continue more than 6 months (*Table I*). Diagnostically, when symptoms like feeling tense, sad or hopeless, withdrawing from other people, acting defiantly or showing impulsive behaviour, or physical manifestations like tremors, palpitations and headaches last between 3 to 6 months, it gets classified as adjustment related disorders.[7]

Table I - Clinical symptoms of PTSD

Symptoms of PTSD, divided in 4 clusters
Intrusive thoughts such as repeated, involuntary memories; distressing dreams; or flashbacks of the traumatic event. Flashbacks may be so vivid that people feel they are re-living the traumatic experience or seeing it before their eyes.
Avoiding reminders of the traumatic event may include avoiding people, places, activities, objects and situations that bring on distressing memories. People may try to avoid remembering or thinking about the traumatic event. They may resist talking about what happened or how they feel about it.
Negative thoughts and feelings may include ongoing and distorted beliefs about oneself or others (e.g., "I am bad," "No one can be trusted"); ongoing fear, horror, anger, guilt or shame; much less interest in activities previously enjoyed; or feeling detached or estranged from others.
Arousal and reactive symptoms may include being irritable and having angry outbursts; behaving recklessly or in a self-destructive way; being easily startled; or having problems concentrating or sleeping.
Symptoms of PTSD are grouped into 3: '*re-experiencing*' (flashbacks, nightmares, repetitive and distressing images / sensation, pain, sweating, trembling), '*avoidance and emotional numbing*' and '*hyperarousal*' (irritability, anger, sleeping difficulty, difficulty concentrating).[8]

Method of conducting this review

To identify articles that focused on PTSD and burns, the terms 'burns', 'post traumatic stress disorder', 'PTSD', 'stress', and 'trauma' were used. To identify articles that focused on specific terms like 'acute stress disorder', 'acute PTSD', 'chronic PTSD', 'subsyndromal PTSD', 'moderate burns', 'severe burns', 'anxiety disorders', 'traumatic' and other terms were used. These two search strategy results were combined with an "and" statement in data bases, along with the term 'trauma' or 'burns related trauma' or 'burns', with the time frame being specified from 1995 through 2020. The databases used were Medline, Pubmed, Google Scholar and the Cochrane Database on Systematic Reviews. In total, 288 articles were identified, which included reviews, mini reviews, meta-analyses, original research papers and treatment-related studies in patients with burns and PTSD.

We included studies of importance with sample sizes of more than 30 participants and which reported either mean scores or percentages with appropriate statistical analysis. Review papers that were systematic, clinical and narrative reviews were included as the number of specific reviews and original research papers was limited. All the authors reviewed all of the articles, and the articles that were in keeping with the topic of the current review were chosen. This was based on the relevance to the topic of PTSD related to burn injuries. A total of 112 papers were reviewed by the authors and 66 articles were included in this paper. This was supplemented with the personal clinical experience of two of the authors (AD, SK) who work regularly with burns patients in a tertiary general hospital and have further insight into PTSD that may occur in these populations. All the authors are researchers and working in clinical settings. Details are shown in *Fig. 1*. All the studies included in this review were studies of patients with burn injuries that were either cross sectional or followed up prospectively over time. There were two studies that compared suicidal and accidental burns in subjects.

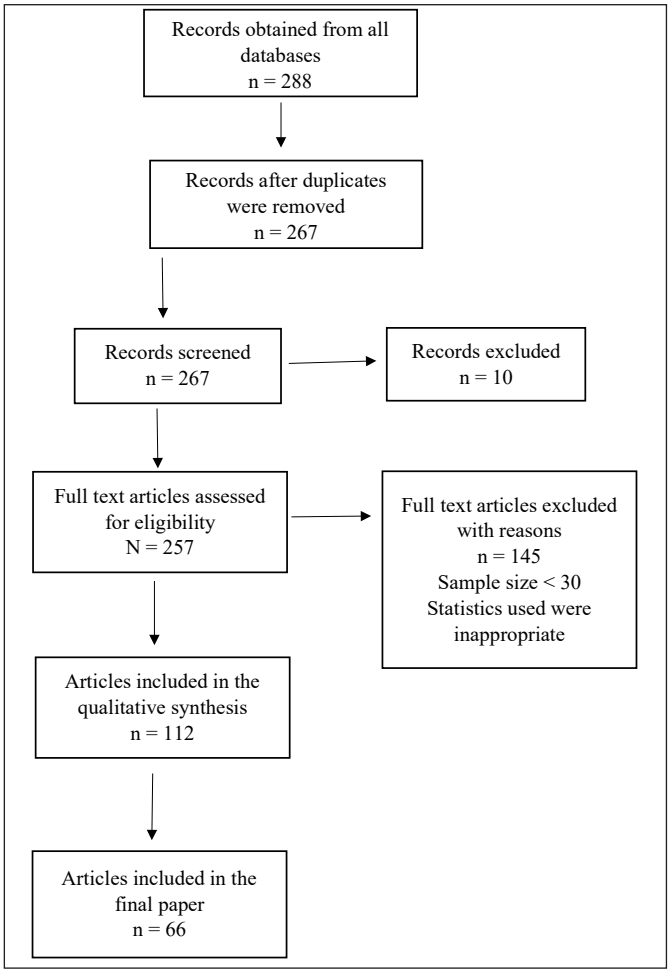

Fig. 1 - Algorithm for selection of papers included in the review

Risk factors for psychological sequalae (PTSD) following burns

There are several risk factors associated with developing post-traumatic stress disorder after burns and they usually entail different socio-demographic reasons.[9] Some of these are as follows:

- **Gender**: Although males have a higher incidence of injury for various injury mechanisms, females have a higher rate of death from burns compared to males.[10] However, the psychological ramifications along with development of PTSD are noted in both males and females. Rates of PTSD are higher among women because the incidence of facial burns is higher in women, which is related to trauma resulting from disfigurement (society often sees the phys-

ical appearance and beauty of women as assets).[11] Another factor that can possibly add to the gendered experience of PTSD is that there are several psychosocial reasons like interpersonal violence, dowry and domestic abuse that inadvertently increase the incidence of burns and inevitable experience of PTSD among females (that results not only from the burn injuries but also due to the causal factors for the same that are interpersonal in nature).[12]

- **Age:** Burn injuries in children are more common than anticipated, labelled as the fifth leading cause of non-fatal childhood injuries. One of the major causes of burn injuries among children is maltreatment and abuse.[13] Research literature has found younger age to predict development of PTSD in later ages, and also a prevalence of PTSD in younger age groups suffering from burn injuries. Another factor that increases the risk is the role of body image. The younger age group is bound to be affected by apparent differences in physical appearance.[14]
- **Socioeconomic status**: Within all countries risk for burn injuries is correlated with socioeconomic status. Socioeconomic status (SES) encompasses not just income but also educational attainment, financial security and subjective perceptions of social status and social class.[15]
- **Other factors:** Some other risk factors that play a crucial role in accelerating the incidence of post-traumatic stress disorder following burn injuries are incidence of interpersonal violence and abuse, resilience recovery variables and coping strategies, and availability of social support. Studies have shown that lack of available social support increases the risk for PTSD in patients with burn injuries. Similarly, avoidance-based and ambivalent coping strategies are predictors of more severe PTSD.[16]

Comorbid conditions with PTSD following burns

Understanding the psychological ramifications of patients with burn injuries is contingent on several factors, viz. the nature of burn injury, the perpetrator, relationship of the burn patient with the perpetrator, pre-burn psychiatric illnesses and severity of burns. Notedly, it is not just psychological but also biological and social changes and challenges that victims of burn injuries are thwarted with. Psychological distress and psychiatric sequalae emanate from the very incident of the injury and perpetuate after the injury, making recovery and rehabilitation painstakingly difficult for the victims. It is the psychological consequences of burn that need equally important attention to treatment in order to ensure compliance with long term treatment and recovery.[17]

The psychological impact of burn injuries encompasses myriad reactions, from pain to developing psychopathological reactions to the burns. Though burn in itself is a very painful injury, the management of the physical injuries as well as the psychological facets are tedious to manage right from the beginning. The care for these injuries is long lasting, from several months to several years, involving a tremendous amount of pain in the management of burn injuries too. Psychiatric sequelae after burns range from acute stress disorder, post-traumatic stress disorder to anxiety, depression, pain, insomnia or troubled sleeping, nightmares and impaired functioning.[18]

Substance use disorder and less pronounced psychological problems also interfere with compliance to treatment and rehabilitation. Additionally, studies that have administered systematic psychiatric symptom screening have also revealed incidences of phobia, body dysmorphic disorder, somatoform disorder and adjustment disorder.[19]

Psychiatric symptoms may not always appear immediately in burn victims but can develop some weeks / months after the burn injury. The most commonly seen psychiatric sequelae among patients with burn injuries are depression, acute stress disorder, post-traumatic stress disorder (PTSD) and sleep problems (insomnia and nightmares), which exist with co-existing illnesses and psychological disorders.[20] A study conducted in two Finnish hospitals found that substance use was the most common (27.2%) psychiatric sequela among burn patients, followed by anxiety and mood disorders (21.7% and 15.2%) and disorders due to general medical conditions (16.3%). Most of the patients who suffered from PTSD were suffering from PTSD for the first

time after the burn incident, whereas most patients had some form of Axis I disorder before the burn injury.[21]

Cognitive changes such as extreme drowsiness, confusion and disorientation are common during this phase. More severe cognitive changes such as delirium and brief psychotic reactions also occur, usually as a result of infections, alcohol withdrawal, metabolic complications, or high doses of drugs.[22]

Other psychological factors in the development of PTSD following burns

It is conspicuous that quality of life at several realms is posed to be compromised for burn patients. There are some prudent factors that come together to determine how much the individual stands resilient in post-burn injuries, the factors being personality variables of the individual, premorbid / pre-existing psychiatric factors, peri-traumatic factors (like pain and coping mechanisms) and post-burn facts such as available social support, ease of returning to work and maintaining day-to-day functioning. Psychological distress among burn patients manifests in the following manner:

- The fact that it may be difficult for patients to return to normal functioning in itself may be a factor of psychological distress. This is more cumbersome when there has been a premorbid psychiatric condition to burns.[23]
- As discussed, apart from the huge amount of psychological distress that comes from the burn injury, the distress only amplifies with treatment and rehabilitation given that treatment entails painful procedures (cleaning wounds, scraping the skin, physiotherapy that can be painful, frequent dressings and grafting) that cause itching, pain, nightmares, anxiety and insomnia during the treatment. The first year following burn injury is uniquely challenging.[24]
- Even after hospitalisation, rehabilitating patients is challenging as it is met with several additional challenges such as dealing and adapting to the deformities that may have resulted due to burns, change in body image, difficulty in returning to work, sexual dysfunction, family strains and disrupted daily functioning.[25]
- In a patriarchally driven world where body positivity is still gaining acceptance, a lot of issues with body image, concerns over body and appearance post-burns is a struggle due to societal stigma (personal clinical experience – AD).
- Low self-esteem, low self-confidence inferiority complex, guilt and shame are some prominent psychological experiences that are consequent post burn injury. This is further amplified among women who are generally expected to look pretty.[26]
- Another crucial aspect post burns that result from heinous acts of acid attacks is that women are further blamed and held responsible for not complying to the male's interest. In our society, most acid attacks take place to avenge rejection.[27]

Acute stress disorder and PTSD after burn injury

In one study, more than 90% of burns victims were found to experience some symptoms of stress within the first week of the injury and more than 45% were found to develop signs of chronic stress that could be categorized as PTSD after 1 year.[18] Acute stress is an immediate reaction that is warranted to be observed in burn patients as a result of the severity of burns. Even if burns may not be TBSA (total body surface area) or second / third degree burns, it is an injury that predisposes the burn victims to inevitable stress and pain. Post-traumatic stress disorder (PTSD) is a potential consequence of severe burn and as literature reports, it is experienced quite frequently. Studies reveal that the prevalence of PTSD (full-blown symptoms) among burn patients may range from 3%-58% after the burn injury.[28-30] Post-traumatic stress disorder most likely occurs either 3-6 months after the injury or sometimes even a year later. PTSD after burns is not only a health care concern but also a social concern. The experience of PTSD following burns is also explained by the negative external attribution / blaming others for the incident, and blaming others has been found to be correlated with poor adjustment and poor mental health. Also, that the feeling of loss of control is greater when one knows that someone else has caused the injury versus being responsible for

the trauma.[30] This would elicit an interesting difference in the experience of PTSD symptoms in people who experienced burns as a result of an activity of another versus people who suffered burns as a result of an activity of self. PTSD has also been found to have strong correlations with negative emotions like anger.[31]

An affective facet to burns also helps us understand that negative emotions are paramount when the attribution of burns is external, on another person, whereas forgiveness comes more easily when the attribution is internal (to self). This dynamic is fragile as the 'nature' of burn injury is crucial to attribute negative emotions or forgiveness.[32] We know that most burn injuries happen either at home or at the workplace. For instance, in the case of an accidental burn injury, if the patient has a close personal (or professional) relationship with the perpetrator, there is a chance that although attribution is external, attribution is also situational and thus, the intensity of negative emotions is low (affect can be relatively neutral as well). On the other hand, if the perpetrator has purposely committed the act of injury towards the patient, there is a greater amount of anger and negative emotions as well as bleak or no chance of forgiveness. However, in relation to PTSD, forgiveness may be feeble towards the self and others, as is confirmed by sparing study samples.[33] PTSD has been found to be prevalent in male and female burn victims. The distinguishing factor among the genders can be subject to underlying biological and psychological factors, age factors and cause of burn injuries. However, there is a need for larger studies to be undertaken in order to better understand the influence of these factors.

Self-immolation in protest and PTSD

The act of self-immolation is circumscribed under the act of suicide and is closely tied to protest against historical, religious or social reasons.[34] The incidence of self-immolation accounts from 0.4 to 40% of burns in centres all over the world and in developing countries; suicide in the form of self-immolation accounts for about 41%. Developed countries see about 1-18% of suicide cases as being self-immolation. The act of self-immolation also leaves psychological effects on the witnesses and family members as well.[35]

In India, self-immolation as an act has been carried out by individuals in protest for various reasons such as *'sati'* (when a woman self immolates herself on the burning pyre of her husband), *'jauhar'* (Rajput women self-immolated themselves to protect themselves from humiliation and molestation in the face of defeat) and students have also self-immolated in protest of constitutional demands such as reservation of seats.[36]

Studies have shown that witnesses or people who have seen the act of self-burning are at an increased risk for developing PTSD. Research also reveals that people who are witnesses to the act of suicide don't necessarily have an increased risk of attempting suicide but there is a relatively long-term impact on increased incidence for developing depression, anxiety and PTSD. The increased risk for PTSD in witnesses of completed suicide has been reported in other studies as well.[37]

The incidence for developing post-traumatic stress disorder is also high among survivors of self-immolation. Although about 80% of patients hospitalised due to self-immolation die, a small percentage that survive are at risk for developing PTSD. There are some mixed nuances to self-immolation that have been studied. Some studies have found more females choosing the method of burning themselves whereas other studies have found no such difference between males and females; some studies have delineated not social and political but economic and familial reasons for self-immolation; some studies reported a preponderance of psychiatric illnesses in these individuals, whereas other studies have reported that individuals who chose to self-immolate had no history of psychiatric illness and lastly, some studies report that self-immolation was not always successful, whereas other studies have reported death as a result of self-immolation.[38]

Suicidal burns and PTSD

Accounting for 0.4 to 9% of burn patients, the proportion of patients with burns by suicide attempt in Western Europe and the industrialized countries is low, whereas suicidal burns are far more common in Asia and the Middle East.[39] Many authors have fo-

cused on psychiatric history, depression and factors predisposing to suicidal burn, while other studies have failed to yield information on psychiatric diagnoses, personality disorders or predisposing characters and possible changes after the survived attempt.[40] Few studies exist on further suicide attempts or psychosocial adjustment, while studies on long-term psychosocial adjustment in patients with severe suicidal burn injuries reveal that patients with good premorbid psychosocial integration could cope surprisingly well with the functional impairment and stigmatizing residuals. Suicidal burns and PTSD is an understudied phenomenon and needs future research.[41]

Acid attack burns and PTSD

Acid violence is a heinous crime that involves throwing an acid mainly on the face/body of the victims. The incidence of acid attacks in India account for approximately 500 cases every year, of which 85% of victims are female. The worldwide account for acid violence cases is approximately 1500 annually.[42] The rate of PTSD found among acid attack survivors is found to be approximately 33-36%. In addition to the excruciating pain, scars and functional disability (and various other complications that go along with burns, as explained above), post-traumatic stress disorder is experienced by victims of acid attacks. Other psychological consequences of acid violence entail the development of depression, insomnia and anxiety, and in many cases comorbid substance use disorder is seen as a result of dealing with the pain and trauma.[43] Unfortunately, there is a dearth of research in the literature that tries to understand the experiences and effects of PTSD and the factors that promote post traumatic growth in these victims.

A psycho-social understanding reveals that acid attacks, being one of the most heinous crimes, also leave long-term psycho-social ramifications for the victim. Most acts of acid violence are vengeful, where men want to avenge the 'rejection' they face from the women. Since the woman's beauty is considered prime in the society, these acts are carried out with an intention to disfigure that beauty, which leaves irreversible marks of physical, psychological and social scars.[44] Some prime reasons that are often cited as causes of acid attacks are rejection of a marriage proposal, doubt on the woman's character, marital discord, marital affair, drug addiction (in the male partner) and dowry. Such practices are higher in countries that grapple with the strong holds of patriarchy versus those that adopt egalitarian practices. The consequences of such violent attacks are often far removed from sympathetic support because these acts are carried out with a sense of deep-seated hatred, anger and feelings that women are inferior (to men), with an intention to damage the beauty of women that is (mistakenly) considered as the only asset that women have. The act intended to pulverise a woman's future prospects of marriage, career and romantic life also comes with an inherent need to demonstrate their own (male) power and brutality. Women often get viewed with more disdain after the attack, are often looked down upon and blamed for having invited the attack, relatives show adverse behaviour, and society often responds with non-acceptance. There is an inevitable impact on the overall mental health of acid survivors in terms of their lack of effective coping, dwindled self-esteem and confidence, especially in the absence of family support, wanting to be alone and not moving out of the house or meeting friends or going to work (social isolation).[45]

Research shows that the psychological makeup (a pattern of thoughts that motivates an individual to react in a particular manner) of an individual facilitates how victims respond / react to the situation. Whereas on one hand adaptive psychological makeup helps to have a healthier reaction and become more resilient, maladaptive psychological makeups can lead to one feeling hopeless and suicidal.[46] However, what is key to remember is that guilt, shame and feelings of helplessness and hopelessness are closely interlinked with the victims' experiences and must be nevertheless addressed.

Psycho-social risk factors contributing to PTSD post burns in Indian culture

In India, where patriarchal holds are still firm and women continue to get treated as second-class citi-

zens, violence against women is high. Although both males and females are victims of burns, the incidence of burn injury is higher among females, especially so when the reason for burns is domestic / familial. Studies have also shown that individuals (mostly females) who suffer burn injuries, including suicidal burn injuries, have had at least 2 major stressors in life. Some commonly-documented reasons for females encountering burn injuries are domestic violence, marital discord and abuse, dowry, birth of a female child (regarded as an inability to give birth to a male child) or mere discord with in-laws.[47]

In the psychiatric sequelae that follow, it is necessary to consider some interpersonal nuances that may amplify the psychological / psychiatric ramifications of burn injuries. For instance, a female surviving burns will be psychologically more affected, even leading to aggravated symptoms of PTSD if the burns are caused accidentally (poor stove / small spaces of cooking) versus caused by someone purposefully, the burn injuries are caused by her husband versus in-laws, or the burn injuries are inflicted by family members versus her self-immolating.[48]

Another basis for recovery involves coping. It has been shown that female victims who adopt self-distracting strategies to cope experience lesser symptoms of PTSD as a result of the denial state, where they are possibly not accepting of the traumatic situation. However, a greater number of victims generally adopt negative coping strategies that lead to them experiencing greater stress for longer periods during recovery. Research findings also delineate that women who blame themselves for the trauma of burn injuries are more likely to have a greater frequency of experiencing symptoms such as re-experiencing the trauma, avoidance and hyperarousal. This is explained as resulting from feelings of guilt, helplessness and hopelessness. They may feel responsible for all the negative incidents and sufferings, thus experiencing severe stress.[49]

Paediatric burns and PTSD

Burns among children, referred to as paediatric burns, is a global problem. Among children too, burns not only affect physiological, psychological, social and functional well-being but they also have a long-term impact that transcends into adulthood. There is clear documentation that paediatric burns affect the wellbeing of both children and their families, the parents more so.[50] In a critical review of the psychological consequences of paediatric burns, it was concluded that 25-30% of children of pre-school age and 10-20% of school-aged children experienced significant traumatic stress reactions less than one month after sustaining a burn (acute phase). These stress reactions included symptoms like avoidance, hyper-arousal and flash backs / re-experiencing the event.[51]

Qualitative findings reveal that in children (8-15 years old) also, the initial trauma is that of the burn injury as well as the treatment procedures involved, which are painful. Apart from that, children reported feeling scared, fearful, worried and in shock. They also found associations between surgery and sleep disturbances and onset of nightmares. Children reported feeling they would wake up during the surgery because of the pain, experiencing nightmares during their inpatient stay or even having recurrent dreams post-surgery.[52] Another important facet to consider here is that some children may require assistance from parents / caregivers / nurses following burn surgeries in order to carry out day-to-day self-care tasks (as a result of functional disability and long recovery time for burn injury). This invokes feelings of being 'dependent' on others and no longer capable of doing small tasks that they could earlier do, as a result of which feelings of anger, frustration and annoyance surface.[53]

Children often question if they will return to functional capabilities, especially playing their favourite sport as they did prior to the burn injury. Severe burn injuries that may hamper the child doing things they like may also possibly incur feelings of depression. Contrastingly, some children also show hypervigilance, taking extra care of their scars. Research findings show that children feel happy returning to school and many children do not find it uncomfortable to tell their friends about the incident except for some children who sometimes feel a 're-experience' every time they mention the burn injury. This could be viewed contrastingly to adults who feel more stigmatic about returning to work. Some

children feel happier seeing their scars getting better, however most of them also feel worried about whether they will recover fully.[54]

Paediatric burn injuries have psychological impacts on children as well as on their families; the traumatic stress is usually measured as a combination of the incident of burn injury, the traumatic stress response to the injury and the long term recovery which also entails traumatic stress.[55]

PTSD in children and adolescents when burns are induced by physical abuse: a poly-trauma perspective

Children with burn injuries make up about 10-12% percent of all child abuse cases, and nearly 10-20% of hospital admissions of children to burn units are the result of child abuse (global average).[56] While comparing accidental burn injuries in children, abused children with burn injuries were found to be significantly younger and have longer duration of hospitalisation, as well as higher mortality rates. Although general awareness of child abuse is on the rise, burn abuse of children remains less so and often goes unrecognised. Child abuse by burning is defined as the intentional act for various reasons by a perpetrator who is generally a child carer or a family member using, according to circumstances, hot liquids, corrosive acids, flame or electrical appliances.[57]

There are various factors involved in the act of inducing paediatric burn injuries. These occur in disturbed / dysfunctional families, children with single parents, substance abuse in families, pent up frustration of the caregivers, desperation, history of potential abuse in the past, families tied down by economic strains like those below the poverty line, and abuse of adolescents, particularly of female domestic workers.[58] Immersion burns may occur during toilet training, with the perpetrator immersing the child in scalding water to clean or punish them. Hands may be immersed in pots of water for playing near the stove. The incidence of burn injuries among children as a result of abuse and neglect has, in some studies, been seen as higher among girls than boys.[57-58]

Need for psycho-social care in PTSD post burns

The first line of care for burn injuries is medical and caters to physical injuries, as that is what is needed for initial and immediate survival. Psychosocial care follows to help victims of burn injuries cope, return to day-to-day functioning and fully participate in society (rehabilitation). Contrary to the expectation, empirical data suggests that many burn patients are well adjusted and do achieve a satisfying quality of life owing to the (accidental) nature of burn, support from family and social groups, and one's psychological adaptive makeup.[59] However, there are several adults (30% at any time) and paediatric burn victims that continue to demonstrate moderate to severe psychological (and psychiatric) difficulties along with social maladjustment.[60]

Empirical findings, clinical observations and self-reports by patients have suggested that when holistic care (medical, psychological, social) is provided for the person, including early and continued attention to psychosocial aspects of the patient's life, positive psychological adaptation can be inculcated in response to the traumatic injury, painful treatment and permanent disfigurement.[61]

Crucial psycho-social aspects in PTSD post burns

Acculturation (the process in which individuals from one culture embrace patterns, customs, beliefs, values and the language of the dominant culture) is a sensitive component while attending to patients. While attending to burn patients, treating professionals should keep differences in cultural backgrounds in mind, which can often be helpful in understanding the nature of the burn injuries.[62-63]

The psychological needs of burns patients are different and unique at every stage of recovery. Depression, anxiety and sleep disturbances are primarily there and need to be addressed at every stage as and when they occur, which will last for longer periods of time across recovery. Family support and counselling are the biggest pillars of non-pharmacological interventions for depression, anxiety and sleep disturbances.

For patients with severe burn injuries, there may

be a suspected fear of death which afflicts the patient as well as the family members. Psychosocial support is needed not only to aid this news of possible death but also to sensitively support the patient and the family members. The disclosing of the news must happen sensitively.[64]

Relaxation techniques, normalisation techniques, reassurance, supportive therapy and psychotherapeutic interventions like cognitive behavioural therapy, interpersonal psychotherapy and more crisis counselling are best helpful to alley the immediate concerns of burn victim patients.[65] Another helpful intervention involves having support groups for patients with burn injuries facilitated by mental health professionals. The group becomes a safe space for many victims to share their stories and learn from each other, and therapeutic growth facilitated in a group most often can have a long-lasting impact for the individuals.[66]

Future research needs and conclusions

The present paper explored the psychological ramifications with a focus on post-traumatic stress disorder experienced in burns patients. A literature search has explored the retrospective, prospective and cross-sectional literature studying the different levels of chronic stress experienced by patients of burn injuries. However, there is a need to focus more on areas to better understand the underlying risk factors of developing post-traumatic stress disorder post burn injury.

Existing research literature studies focus on one or a few aspects in isolation, for instance, studying pain, psychological and/or psychiatric sequelae or ASD and PTSD associated with burn injuries, and though most studies cover risk factors, comorbid conditions and consequences, a comprehensive study is lacking.

Largely, there is a need to study the psycho-social aspect of causes of burn injuries to better understand the consequences, psychological and psychiatric sequelae of the severity of burn injuries. There is also a dearth of literature that independently focuses on the discrepant psychological and psychiatric sequelae of the 'nature' of burn injuries, for example, the psychological sequelae of acid attacks are bound to be very different from the psychological sequelae of accidental burns.

There is a further need to better study coping strategies, psychiatric comorbidities that may exist and the social support available. Research findings must focus on available psychological resilience, personality factors and, very importantly, the interpersonal dynamics between the perpetrator and the victim of burn injuries.

PTSD after burn injuries is an important area of concern in the long-term rehabilitation of burns patients and there is a need for a multidisciplinary approach in the management of both adults and children showing signs of depression, anxiety and PTSD in all forms of burn injuries.

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